

times per week (see Figure 26). In general, public library staffs that serve population of legal service areas of 250,000 or greater make considerably more use of bibliographic utilities than do library staffs that serve population of legal service areas of 249,999 or less. In particular, over 70.0% of public library staffs that serve population of legal service areas of 99,999 or less never use or use bibliographic utilities less than 25 times per week. Public library staffs in the Midwest and Northeast are more likely to never use (32.4% and 33.6%, respectively) or use bibliographic utilities less than 25 times per week (53.1% and 39.8%, respectively).

Figure 26 shows that public library staffs in the South and West, however, are more likely to use bibliographic utilities less than 25 times per week (50.3% and 60.6%, respectively) or 26-50 times per week (14.4% and 12.4%, respectively). Public library staffs in the South and West, therefore, make greater use of Internet-based bibliographic utilities than do library staffs in the Midwest and Northeast.

As Figure 27 shows, public library staffs make infrequent use of the Web, with 33.8% of public library staffs who never use the Web, followed by 41.1% who use the Web less than 25 times per week, 14.9% who use the Web 26-50 times per week, 5.0% who use the Web 51-100 times per week, and 5.1% who use the Web more than 100 times per week. Overall, public library staffs that serve population of legal service areas of 250,000 or greater make considerably more use of the Web than do library staffs that serve population of legal service areas of 249,999 or less. Of particular interest is that nearly half of library staffs that serve population of legal service areas of 9,999 or less never use the Web (46.6% for public library staffs that serve a population of legal service area of 5,000-9,999 and 50.7% for public library staffs that serve a population of legal service area of less than 5,000) or do so less than 25 times per week (39.6% for public library staffs that serve a population of legal service area of 5,000-9,999 and 40.8%, for public library staffs that serve a population of legal service area of less than 5,000).

There are discrepancies in public library staff Web use by region, with a majority of public libraries staffs in the Midwest and Northeast never using (37.1% and 45.4%, respectively) or using the Web less than 25 times per week (40.8% and 36.2%, respectively). More public library staffs in the South and West, on the other hand, use the Web less than 25 times per week (48.8% and 44.8%, respectively) or 26-50 times per week (16.2% and 25.8%, respectively). As such, public li-

brary staffs of libraries in the South or West are more likely to use the Web than are public library staffs of libraries in the Midwest or Northeast.

#### *Public Library Provision of Public Access Internet Services*

Overall, a majority of public libraries do not provide public access Internet services (see Figure 28). A nearly even percentage of public libraries provide graphical Web public access services (23.7%), gopher-based public access services (22.7%), and text-based Web services (22.3%). Only 11.6% of public libraries provide public access newsgroup services, while just 10.0% of public libraries provide e-mail account services. Interestingly, public libraries that serve population of legal service areas of 5,000-9,999 and less than 5,000 provide the highest percentage of public access e-mail accounts (15.2% and 17.2%, respectively). Libraries that serve a population of legal service area of less than 5,000, however, have the lowest percentage of graphical Web service provision with 19.7% as compared to 36.9% of public libraries that serve a population of legal service area of 1 million+. It is worth noting that public libraries that serve population of legal service areas of 249,000 or less provide more public access to newsgroups (percentages ranging from 8.7% to 13.6%) than do public libraries that serve population of legal service areas of 250,000 or greater (percentages ranging from 6.2% to 8.8%).

Figure 28 also shows some noteworthy public access service differences by region. More libraries in the Midwest, 12.9%, provide e-mail account services than libraries in any other region. Libraries in the West, however, provide more newsgroup services, 16.1%, than other libraries. Overall, libraries in the Northeast provide a greater percentage of text-based Web services (27.7%), while libraries in the Midwest provide a higher percentage of graphical Web services (29.3%). Finally, libraries in the Northeast provide the greatest percentage, 28.5%, of gopher-based services.

In general, public libraries do not charge for their public access Internet services (see Figure 29). Of all public libraries providing public access Internet services, 3.6% have some type of fee for their graphical Web services, 3.3% have some type of fee for their e-mail account services, 3.1% have some type of fee for their text-based Web services, 1.7% have some type of fee for their gopher-based services, and 1.2% have some type of fee for their newsgroup services.

**Figure 28. Overall Public Library Provision of Public Access Internet Services by Population of Legal Service Area and Region.**

Population of Legal Service Area						
	E-mail Accounts	Newsgroups Services	Text-Based WWW	Graphical WWW	Gopher-Based Resources	Other
1 million +	9.4%	8.8%	22.8%	36.9%	22.2%	0.0%
500,000-999,999	6.8%	6.8%	28.1%	26.8%	27.5%	4.0%
250,000-499,999	7.1%	6.2%	28.1%	23.9%	24.7%	10.1%
100,000-249,999	6.7%	13.2%	24.6%	27.8%	22.7%	4.9%
50,000-99,999	4.1%	13.4%	24.7%	25.3%	25.5%	6.9%
25,000-49,999	8.6%	12.3%	23.5%	26.3%	22.7%	6.6%
10,000-24,999	9.8%	13.6%	23.1%	27.8%	24.9%	0.7%
5,000-9,999	15.2%	8.7%	24.2%	26.6%	21.9%	3.5%
Less than 5,000	17.2%	13.6%	22.4%	19.7%	25.3%	1.7%

  

Region						
	E-mail Accounts	Newsgroups Services	Text-Based WWW	Graphical WWW	Gopher-Based Resources	Other
Midwest	12.9%	10.9%	21.4%	29.3%	22.6%	2.9%
Northeast	9.0%	11.1%	27.7%	20.6%	28.5%	3.0%
South	9.8%	12.0%	23.7%	28.7%	21.8%	4.1%
West	10.6%	16.1%	21.7%	23.4%	22.6%	5.6%
Overall	10.0%	11.6%	22.3%	23.7%	22.7%	3.5%

Of the 10.0% of public libraries that provide public access e-mail account services, 79.7% provide those services to patrons only at the main/central library, followed by 15.4% that provide those services to patrons at the main/central library and all library branches, and 4.9% that provide those services to patrons at the main/central library and some branches (see Figure 30). Public libraries that serve population of legal service areas of 100,000 or greater tend to provide public access e-mail account services in the main/central library and all branches of the main/central library or some branches (percentages range from 55.2% to 100.0%), whereas public libraries that serve population of legal service areas of 99,999 or less tend to provide public access e-mail account services in only the main/central library (percentages range from

42.5% to 100.0%). Nearly all libraries in the Midwest and Northeast provide e-mail account services in only the main/central library (94.5% and 95.8%, respectively), followed by libraries in the West with 65.2%. Half (50.0%) of libraries in the South, however, provide e-mail account services in the central/main library and all branches.

As Figure 31 demonstrates, 75.4% of the 11.6% of public libraries that provide newsgroup public access services provide such services at the main/central library only, followed by 17.3% that provide public access newsgroup services at the main/central library and all branches, and 7.2% that provide public access newsgroup services at the main/central library and some branches. A majority of public libraries that serve

**Figure 29. Overall Public Library Fee Charges for Public Access Internet Services by Population of Legal Service Area and Region.**

E-mail Accounts	Newsgroups Services	Text-Based WWW	Graphical WWW	Gopher-Based Resources	Other
3.3%	1.2%	3.1%	3.6%	1.7%	0.3%

Figure 30. Public Library Public Access E-Mail Internet Services by Population of Legal Service Area and Region.

Population of Legal Service Area			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
1 million +	0.0%	0.0%	100.0%
500,000-999,999	18.4%	81.6%	0.0%
250,000-499,999	12.5%	55.2%	32.2%
100,000-249,999	27.8%	66.2%	6.0%
50,000-99,999	42.5%	17.9%	39.5%
25,000-49,999	68.8%	21.2%	10.1%
10,000-24,999	83.8%	16.2%	0.0%
5,000-9,999	89.2%	10.8%	0.0%
Less than 5,000	100.0%	0.0%	0.0%

Region			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
Midwest	94.5%	5.5%	0.0%
Northeast	95.8%	1.5%	2.7%
South	45.5%	50.0%	4.5%
West	65.2%	20.1%	14.8%
Overall	79.7%	15.4%	4.9%

Figure 31. Public Library Public Access Newsgroup Internet Services by Population of Legal Service Area and Region.

Population of Legal Service Area			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
1 million +	0.0%	50.0%	50.0%
500,000-999,999	40.8%	36.9%	22.3%
250,000-499,999	15.6%	40.3%	44.1%
100,000-249,999	39.4%	42.2%	18.3%
50,000-99,999	62.8%	22.2%	15.0%
25,000-49,999	78.1%	14.8%	7.1%
10,000-24,999	77.6%	18.8%	3.6%
5,000-9,999	81.2%	18.8%	0.0%
Less than 5,000	100.0%	0.0%	0.0%

Region			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
Midwest	88.9%	10.1%	1.0%
Northeast	82.4%	12.3%	5.3%
South	54.3%	33.1%	12.6%
West	70.4%	18.6%	11.0%
Overall	75.4%	17.3%	7.2%

population of legal service areas of 100,000 or greater provide newsgroup services in the main/central library and all branches or the main/central library and some branches (percentages range from 18.3% to 50.0%). Public libraries that serve population of legal service areas of 99,999 or less, however, generally provide public access newsgroup services in only the main/central library (percentages ranging from 62.8% to 100.0%).

A majority of libraries in all regions tend to provide newsgroup services in only the main/central library (percentages ranging from 54.3% to 88.9%). Libraries in the South and West, however, are more likely to provide patron newsgroup services in the main/central library and all branches (33.1% and 18.6%, respectively) or the main/central library and some branches (12.6% and 11.0%, respectively) than libraries in the Northeast and Midwest (10.1% and 12.3%, respectively, in the main/central library and all branches, and 1.0% and 5.3%, respectively, in the main/central library and some branches).

Of the 22.3% of public libraries that provide text-based public access Web services, 70.3% provide such services at the main/central library only, followed by

20.7% that provide text-based web services at the main/central library and all branches, and 9.0% that provide text-based web services at the main/central library and some branches (see Figure 32). Overall, public libraries that serve population of legal service areas of 100,000 greater provide text-based public access Web services at the main/central library and all branches (percentages ranging from 46.2% to 70.5%) or at the main/central library and some branches (percentages ranging from 13.9% to 40.2%). Public libraries that serve population of legal service areas of 99,999 or less essentially provide text-based Web services at the main/central library only (percentages ranging from 53.7% to 100.0%).

Libraries in the Midwest, Northeast, and West are most likely to provide text-based Web services at only the main/central library (percentages ranging from 64.6% to 88.6%). A majority of libraries in the South (55.8%), however, provide text-based Web services in the main/central library and some of all branches. Libraries in the South, therefore, provide more pervasive text-based Web patron services.

As Figure 33 indicates, of the 23.7% of public libraries that provide patron access graphical Web ser-

**Figure 32. Public Library Public Access Text-Based World-Wide Web /Internet Services by Population of Legal Service Area and Region.**

Population of Legal Service Area			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
1 million +	0.0%	61.6%	38.4%
500,000-999,999	14.3%	70.5%	15.3%
250,000-499,999	3.5%	56.3%	40.2%
100,000-249,999	40.0%	46.2%	13.9%
50,000-99,999	53.7%	23.3%	23.0%
25,000-49,999	79.0%	17.3%	3.7%
10,000-24,999	70.5%	20.8%	8.7%
5,000-9,999	90.0%	10.0%	0.0%
Less than 5,000	100.0%	0.0%	0.0%

  

Region			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
Midwest	88.6%	10.7%	0.8%
Northeast	73.8%	20.9%	5.3%
South	44.2%	32.7%	23.1%
West	64.6%	22.5%	12.9%
Overall	70.3%	20.7%	9.0%

**Figure 33. Public Library Public Access Graphical World-Wide Web Internet Services by Population of Legal Service Area and Region.**

Population of Legal Service Area			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
<b>1 million +</b>	13.5%	24.6%	61.9%
<b>500,000-999,999</b>	31.9%	27.3%	40.8%
<b>250,000-499,999</b>	28.1%	15.1%	56.8%
<b>100,000-249,999</b>	48.9%	30.8%	20.4%
<b>50,000-99,999</b>	71.8%	12.2%	16.1%
<b>25,000-49,999</b>	82.7%	10.1%	7.3%
<b>10,000-24,999</b>	91.3%	6.9%	1.8%
<b>5,000-9,999</b>	96.7%	3.3%	0.0%
<b>Less than 5,000</b>	100.0%	0.0%	0.0%

  

Region			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
<b>Midwest</b>	89.1%	6.6%	4.3%
<b>Northeast</b>	93.8%	2.2%	4.0%
<b>South</b>	62.5%	21.0%	16.4%
<b>West</b>	70.2%	13.9%	15.8%
<b>Overall</b>	80.6%	10.1%	9.3%

vices, 80.6% of libraries provide such services at the main/central library only, followed by 10.1% that provide graphical Web services at the main/central library and all branches, and 9.3% that provide graphical Web services at the main/central library and some branches. In general, public libraries that serve population of legal service areas of 100,000 or greater provide public access graphical Web services at the main/central library and all branches (percentages ranging from 15.1% to 30.8%) or at the main/central library and some branches (percentages ranging from 20.4% to 61.9%). Public libraries that serve population of legal service areas of 99,999 or less generally provide graphical Web services at only the main/central library (percentages ranging from 71.8% to 100.0%).

A majority of public libraries in the Midwest (89.1%), Northeast (93.8%), South (62.5%), and West (70.2%) provide graphical Web services at only the main/central library. Considerably more libraries in the South and West, however, are apt to provide graphical Web services at the main/central library and all branches (21.0% and 13.9%, respectively) at the main/central library and some branches (16.4% and

15.8%, respectively) than libraries in the Midwest and Northeast.

Of the 22.7% of public libraries that provide public access gopher services, 75.9% provide such services at the main/central library only, followed by 17.8% that provide gopher services at the main/central library and all branches, and 6.3% that provide gopher services at the main/central library and some branches (see Figure 34). Overall, public libraries that serve population of legal service areas of 100,000 or greater provide public access gopher services at the main/central library and all branches (percentages ranging from 19.7% to 62.3%) or at the main/central library and some branches (percentages ranging from 10.5% to 59.2%). Public libraries that serve population of legal service areas of 99,999 or less generally provide gopher services at only the main/central library (percentages ranging from 63.5% to 100.0%).

Libraries in the Midwest, Northeast, and West are most likely to provide gopher services at only the main/central library (percentages ranging from 65.8% to 86.1%). A majority of libraries in the South (51.7%),

**Figure 34. Public Library Public Access Gopher Internet Services by Population of Legal Service Area and Region.**

Population of Legal Service Area			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
1 million +	21.1%	19.7%	59.2%
500,000-999,999	25.6%	62.3%	12.0%
250,000-499,999	12.4%	53.5%	34.1%
100,000-249,999	40.8%	48.7%	10.5%
50,000-99,999	63.5%	29.4%	7.1%
25,000-49,999	77.9%	13.7%	8.4%
10,000-24,999	78.3%	16.6%	5.1%
5,000-9,999	100.0%	0.0%	0.0%
Less than 5,000	100.0%	0.0%	0.0%

  

Region			
	At Main/Central Library Only	At Main/Central Library & All Branches	At Main/Central Library & Some Branches
Midwest	86.1%	10.3%	3.5%
Northeast	83.7%	15.0%	1.3%
South	48.4%	38.5%	13.2%
West	65.8%	19.4%	14.8%
Overall	75.9%	17.8%	6.3%

however, provide gopher services in the main/central library and all branches or the main/central library and some branches. Public libraries in the South, therefore, provide more distributed public access gopher services to patrons.

In general, a vast majority of public libraries do not provide patrons with remote dial-in capabilities to library public access Internet services (see Figure 35). In all, 10.1% of public libraries provide dial-in text-based Web services, followed by 6.5% of public libraries that provide dial-in gopher services, 6.3% of public libraries that provide dial-in e-mail account services, 3.4% of public libraries that provide dial-in graphical Web services, and 2.6% of public libraries that provide dial-in newsgroup services. While a trend is difficult to discern among dial-in services by population of legal service area, the data show that, overall, as public library population of legal service area increases, so too does the provision of dial-in services. This is particularly true for text-based Web, graphical Web, and gopher services in public libraries that serve population of legal service areas of 250,000 or greater (percentages ranging from 0.0% to 33.1%). It is particularly interesting to note that the highest percentage of

dial-in e-mail account services occurs in libraries that serve a population of legal service area of less than 5,000, with 10.4%.

Libraries in the Midwest and Northeast are more likely to provide dial-in capabilities to e-mail account services (7.0% and 7.9%, respectively) than libraries in the South and West (3.1% and 4.1%, respectively). Libraries in the Northeast and South are more likely to provide dial-in capabilities to text-based Web services (13.4% and 10.6%, respectively) than are libraries in the Midwest and West (7.9% and 2.5%, respectively). Other dial-in capabilities for public access Internet services appear relatively even across the four library regions.

Figure 36 presents the distribution of those public libraries that provide remote dial-in Internet services by population of legal service area and region. The data demonstrate an interesting split by population of legal service area: (1) In general, larger public libraries provide dial-in Web and gopher services, and (2) Smaller libraries provide dial-in e-mail account and newsgroup services. A different picture emerges, though, when looking at the data by region. Libraries

**Figure 35. Overall Public Library Public Access Remote Dial-In Internet Services by Population of Legal Service Area and Region.**

Population of Legal Service Area					
	E-mail Accounts	Newsgroups Services	Text-Based WWW	Graphical WWW	Gopher-Based Resources
1 million +	0.0%	0.0%	7.4%	6.9%	0.0%
500,000-999,999	9.2%	6.7%	28.1%	10.1%	33.1%
250,000-499,999	6.8%	1.6%	27.0%	2.0%	18.2%
100,000-249,999	3.3%	3.5%	11.4%	2.2%	3.2%
50,000-99,999	1.8%	1.0%	11.4%	9.1%	4.5%
25,000-49,999	6.0%	3.0%	6.6%	4.0%	5.7%
10,000-24,999	7.0%	4.1%	11.1%	3.7%	7.3%
5,000-9,999	1.6%	1.6%	1.6%	1.6%	0.0%
Less than 5,000	10.4%	2.0%	12.9%	2.0%	9.2%

  

Region					
	E-mail Accounts	Newsgroups Services	Text-Based WWW	Graphical WWW	Gopher-Based Resources
Midwest	7.0%	2.7%	7.9%	3.6%	5.4%
Northeast	7.9%	2.1%	13.4%	2.2%	8.3%
South	3.1%	2.2%	10.6%	5.2%	6.0%
West	4.1%	4.0%	2.5%	3.7%	5.7%
Overall	6.3%	2.6%	10.1%	3.4%	6.5%

**Figure 36. Public Library Public Access Remote Dial-In Internet Services by Population of Legal Service Area and Region.**

Population of Legal Service Area					
	E-mail Accounts	Newsgroups Services	Text-Based WWW	Graphical WWW	Gopher-Based Resources
1 million +	0.0%	0.0%	51.6%	48.4%	0.0%
500,000-999,999	10.6%	7.7%	32.2%	11.6%	38.0%
250,000-499,999	12.2%	2.9%	48.6%	3.5%	32.8%
100,000-249,999	13.9%	14.9%	48.4%	9.2%	13.6%
50,000-99,999	6.4%	3.8%	40.9%	32.8%	16.1%
25,000-49,999	23.6%	11.9%	26.2%	15.9%	22.4%
10,000-24,999	21.0%	12.3%	33.5%	11.2%	21.9%
5,000-9,999	25.0%	25.0%	25.0%	25.0%	0.0%
Less than 5,000	28.5%	5.5%	35.4%	5.5%	25.2%

  

Region					
	E-mail Accounts	Newsgroups Services	Text-Based WWW	Graphical WWW	Gopher-Based Resources
Midwest	35.7%	13.6%	40.3%	18.4%	27.7%
Northeast	30.5%	8.2%	51.5%	8.4%	31.9%
South	11.6%	8.2%	39.0%	19.3%	21.9%
West	19.7%	19.4%	35.3%	17.9%	27.3%
Overall	21.8%	8.9%	35.0%	11.8%	22.5%

**Figure 37. Public Library Internet Services Component Costs by Libraries that Provide Public Access Graphical World-Wide Web Internet Services.**

	System Costs	Software Costs	Communications Costs	Training/ Education Costs	Content/ Resources Costs	Planning Costs
No Graphical Web	35.3%	19.1%	24.3%	10.2%	5.1%	6.1%
Graphical Web	37.1%	12.3%	25.4%	9.2%	7.9%	8.0%
Overall	35.8%	17.0%	24.7%	9.9%	6.0%	6.7%

in the Midwest and Northeast (35.7% and 30.5%, respectively) are approximately twice as likely to provide dial-in e-mail services than libraries in the South and West (11.6% and 19.7%, respectively). Furthermore, libraries in the Midwest and West (13.6% and 19.4%, respectively) are more likely than libraries in the Northeast and South to provide dial-in newsgroup services (both at 8.2%). Also, a majority, 51.5%, of libraries in the Northeast provide dial-in access to text-based Web services. Finally, libraries in the Midwest, South, and West (18.4%, 19.3%, and 17.9%, respectively) are twice as likely as libraries in the Northeast (8.4%) to offer dial-in graphical Web services.

Figures 37 and 38 compare the costs of Internet service provision (survey question 12) and type of public library Internet service provider (survey question 14) to public libraries currently providing graphical Web versus non-graphical Web access. Neither set of figures show substantial differences between libraries providing public access graphical versus non-graphical Web access, indicating that overall library Internet costs and Internet service providers for public library Internet connections are approximately the same for graphical and non-graphical Web library services.

Public libraries provide slightly more text-based public access terminals than graphical workstations, with 34.5% and 27.7%, respectively (see Figure 39). Interestingly, libraries serving population of legal service areas of 99,999 or less provide near equal percentages of public access text-based terminals and graphical workstations (percentages ranging from 22.4% to 36.0%), whereas public libraries serving population of legal service areas of 100,000 or greater provide a higher percentage of public access text-based terminals (percentages ranging from 39.7% to 59.9%) than graphical workstations (percentages ranging from 19.9% to 37.7%).

In terms of average public access terminal or workstation numbers, however, libraries that serve population of legal service areas of 100,000 or greater have considerably more available public access terminals (average number ranging from 11.1 to 109.1) and graphical workstations (average number ranging from 3.8 to 26.1) than do libraries that serve population of legal service areas of 99,999 or less (average number of text-based terminals ranging from 0.6 to 7.6, and average number of graphical workstations ranging from 0.5 to 2.9).

**Figure 38. Public Library Internet Service Providers by Libraries that Provide Public Access Graphical World-Wide Web Internet Services.**

	Local / State Provider	Comm. Provider	Educational Provider	Free-Net	State Library	Regional / State	Other
No Graphical Web	17.0%	18.4%	12.3%	6.3%	17.1%	17.0%	12.0%
Graphical Web	19.3%	20.7%	10.7%	6.5%	22.2%	11.9%	8.8%
Overall	17.6%	18.9%	11.9%	6.3%	18.4%	15.7%	11.2%



**Figure 39. Average Public Library Public Access and Staff Terminals and Graphical Workstations by Population of Legal Service Area and Region.**

Population of Legal Service Area						
	Percentage of Text-Based Terminals	Percentage of Graphical Workstations	Average Number of Text-Based Terminals	Average Number of Workstations	Percentage of Staff Terminals	Average Number of Staff Terminals
1 million +	39.8%	19.9%	109.1	19.8	71.8%	65.7
500,000-999,999	59.9%	37.7%	82.4	26.1	85.2%	75.4
250,000-499,999	40.7%	29.9%	35.5	12.8	77.4%	34.5
100,000-249,999	39.7%	29.7%	11.1	3.8	75.0%	12.6
50,000-99,999	35.2%	30.3%	7.6	2.9	77.2%	9.0
25,000-49,999	36.0%	34.6%	2.8	1.7	71.2%	5.5
10,000-24,999	33.7%	27.6%	2.5	0.9	68.4%	3.1
5,000-9,999	33.8%	27.3%	0.9	0.6	44.9%	1.1
Less than 5,000	31.7%	22.4%	0.6	0.5	39.5%	0.7

  

Region						
	Percentage of Text-Based Terminals	Percentage of Graphical Workstations	Average Number of Text-Based Terminals	Average Number of Workstations	Percentage of Staff Terminals	Average Number of Staff Terminals
Midwest	30.3%	24.8%	4.2	1.6	55.8%	5.4
Northeast	39.1%	21.0%	2.5	0.9	53.1%	3.0
South	30.8%	38.6%	6.5	3.2	73.3%	6.6
West	39.4%	39.0%	11.4	3.5	61.2%	10.5
Overall	34.5%	27.7%	4.9	1.9	58.5%	5.5

Also, as public library population of legal service area increases, so too do the percentage and average number of terminals and/or workstations specifically for library staff use. Nearly 70.0% or more of public libraries that serve population of legal service areas of greater than 10,000 provide separate library staff Internet terminals and/or workstations (percentages ranging from 68.4% to 85.2%). Fewer than 45.0% of public libraries that serve population of legal service areas of less than 10,000, however, provide separate library staff Internet terminals and/or workstations (percentages ranging from 39.5% to 44.9%).

As Figure 39 shows, public libraries in the South and West are more likely than libraries in the Midwest and Northeast to have public access graphical workstations (38.6% and 39.0%, respectively, as compared to 24.8% and 21.0%, respectively), have a higher aver-

age number graphical workstations (3.2 and 3.5, respectively, as compared to 1.6 and 0.9, respectively), and provide staff-only Internet access terminals (73.3% and 61.2%, respectively, as compared to 55.8% and 53.1%, respectively). Overall, public libraries in the Northeast and West (39.1% and 39.4%, respectively) have a higher percentage of text-based public access terminals than do public libraries in the Midwest and South (30.3% and 30.8%, respectively). Libraries in the South and West, however, have a higher average number of text-based public access terminals (6.5 and 11.4, respectively), than do libraries in the Midwest and Northeast (4.2 and 2.5, respectively).

While the data show that, generally, as library population of legal service area increases the percentage and average number of public access and staff-only terminals/workstations increase, these percentages and

**Figure 40. Ratio of Public Library Public Access Terminals and Graphical Workstations to Average Library Population by Population of Legal Service Area and Region**

Population of Legal Service Area					
	Average Population	Average Number of Text Terminals	Average Number of Workstations	Population Per Text Terminals	Population Per Workstations
1 million +	1,671,560	109.1	19.8	15,321	84,422
500,000-999,999	690,334	82.4	26.1	8,378	26,450
250,000-499,999	343,250	35.5	12.8	9,669	26,816
100,000-249,999	149,049	11.1	3.8	13,428	39,233
50,000-99,999	71,546	7.6	2.9	9,414	24,671
25,000-49,999	34,811	2.8	1.7	12,433	20,477
10,000-24,999	16,476	2.5	0.9	6,590	18,307
5,000-9,999	7,503	0.9	0.6	8,337	12,505
Less than 5,000	2,485	0.6	0.5	4,142	4,970

  

Region					
	Average Population	Average Number of Text Terminals	Average Number of Workstations	Population Per Text Terminals	Population Per Workstations
Midwest	27,937	4.2	1.6	6,652	17,461
Northeast	34,042	2.5	0.9	13,617	37,824
South	91,945	6.5	3.2	14,145	28,733
West	102,811	11.4	3.5	9,019	29,375
Overall	50,203	4.9	1.9	10,150	26,525

numbers can be misleading. Based on the average population served and ALA-accredited MLS FTEs<sup>4</sup> by responding libraries, Figures 40 and 41 provide ratio data of library public access terminals/workstations to the average library population served and library FTEs. These figures show large discrepancies in public access and staff-only terminal/workstation availability by library population of legal service area and region.

In general, as public library population of legal service area increases, the availability of public access terminals/workstations decreases. Indeed, patron populations served by public libraries with a population of legal service area of less than 5,000 are more able to gain access to a text-based terminal (a ratio of 1 terminal per an average population of 4,142) or graphical workstation (a ratio of 1 workstation per an aver-

age population of 4,970), as compared to patrons served by public libraries that serve a population of legal service area of 1 million+ (a ratio of 1 terminal per an average population of 15,321; a ratio of 1 workstation per an average population of 84,422). Such discrepancies do not exist with staff-only terminals/workstations, with nearly all libraries in the population of legal service area categories possessing an average ratio of 1 terminal per ALA-accredited MLS FTE (see Figure 41). The notable exception is libraries that serve a population of legal service area of 1 million+ — these libraries have an average ratio of 1 terminal to every 2 ALA-accredited MLS FTEs.

As Figure 40 shows, public libraries in the Midwest (1 terminal for every 6,652 persons) and West (1 terminal for every 9,019 persons) provide more public access text-based terminals to their populations served

<sup>4</sup>It is important to note that the average FTE figures are based on library ALA/MLS professional staff as defined by the FSCS universe file. As such, the number of library staff using staff-only public access terminals/workstations could be higher than reported in Figure 38.

**Figure 41. Ratio of Public Library Staff Terminals and/or Workstations to Library FTEs by Population of Legal Service Area and Region.**

Population of Legal Service Area			
	Average FTEs	Average Number of Staff Terminals Per Workstations	Terminals and/or Workstations Per FTE
1 million +	165.9	65.7	0.4
500,000-999,999	69.8	75.4	1.1
250,000-499,999	38.9	34.5	0.9
100,000-249,999	16.2	12.6	0.8
50,000-99,999	8.2	9.0	1.1
25,000-49,999	5.3	5.5	1.0
10,000-24,999	3.1	3.1	1.0
5,000-9,999	1.6	1.1	0.7
Less than 5,000	1.0	0.7	0.7

  

Region			
	Average FTEs	Average Number of Staff Terminals Per Workstations	Terminals and/or Workstations Per FTE
Midwest	2.9	5.4	0.5
Northeast	3.7	3.0	1.2
South	5.6	6.6	0.8
West	5.4	10.5	0.5
Overall	4.0	5.5	0.8

than do public libraries in the Northeast (1 terminal for every 13,617 persons) and South (1 terminal for every 14,145 persons). Public libraries in the Northeast provide the fewest public access graphical workstations (1 workstation for every 37,824 persons), followed by public libraries in the West (1 workstation for every 29,375 persons), public libraries in the South (1 workstation for every 28,733 persons), and public libraries in the Midwest (1 workstation for every 17,461 persons). As shown in Figure 41, public libraries in the Northeast and South have nearly twice as many staff-only terminals/workstations (1.2 and 0.8, respectively) as do libraries in the Midwest and West (both at 0.5).

#### *Public Library Remote Dial-In Internet Services*

Of those libraries that provide remote dial-in Internet services (see Figure 35), the average library dial-in service has 1.5 modems, of which 38.3% have a maximum modem speed of 9,600bps, followed by 35.4% that have a maximum modem speed of 28,800bps, and by 26.4% that have a maximum mo-

dem speed of 14,400bps (see Figure 42). Only 11.4% of public library remote dial-in services offer SLIP/PPP connections. As such, a vast majority of public library dial-in services are text-based. Of particular interest is that public libraries that serve population of legal service areas between 5,000 and 49,999 have the highest percentages of SLIP/PPP connections (percentages ranging between 13.7% and 20.7%) and 28,800bps modems (percentages ranging from 41.1% to 53.7%). Libraries that serve a population of legal service area of less than 5,000, however, have the lowest average number of dial-in service modems (0.2), the lowest percentage of SLIP/PPP connections (2.1%), and the lowest percentage of 28,800bps modems (15.0%).

As Figure 42 demonstrates, public library remote dial-in Internet services vary by library region, with libraries in the South and West offering a higher average number of dial-in modems (2.0 and 2.3, respectively) than libraries in the Midwest and Northeast (both at 1.2). Libraries in the West offer the highest percentage of SLIP/PPP connections with 18.7%, fol-

**Figure 42. Public Library Remote Dial-In Internet Service Configuration by Population of Legal Service Area and Region.**

Population of Legal Service Area					
	Configuration of Remote Dial-In Service		Maximum Speed of Connection		
	Average Maximum Number of Modems	SLIP/PPP	9600 bps	14400 bps	28800 bps
1 million +	12.3	7.4%	29.5%	41.9%	28.6%
500,000-999,999	18.7	9.7%	27.9%	28.8%	43.3%
250,000-499,999	6.4	10.0%	40.3%	36.7%	23.0%
100,000-249,999	2.9	12.8%	31.3%	38.8%	29.9%
50,000-99,999	1.6	9.6%	38.4%	24.2%	37.4%
25,000-49,999	1.4	13.7%	42.8%	16.1%	41.1%
10,000-24,999	1.8	16.6%	30.2%	18.0%	51.9%
5,000-9,999	0.3	20.7%	16.9%	29.4%	53.7%
Less than 5,000	0.2	2.1%	54.2%	30.7%	15.0%

  

Region					
	Configuration of Remote Dial-In Service		Maximum Speed of Connection		
	Average Maximum Number of Modems	SLIP/PPP	9600 bps	14400 bps	28800 bps
Midwest	1.2	6.2%	47.6%	24.5%	27.8%
Northeast	1.2	13.9%	36.9%	17.5%	45.6%
South	2.0	12.3%	37.0%	29.7%	33.4%
West	2.3	18.7%	24.0%	37.9%	38.1%
Overall	1.5	11.4%	38.3%	26.4%	35.4%

lowed by libraries in the Northeast with 13.9%, libraries in the South with 12.3%, and libraries in the Midwest with 6.2%. Libraries in the Midwest have the highest percentage of 9,600bps modems (47.6%), while libraries in the West have the highest percentage of 14,400bps modems (37.9%), and libraries in the Northeast have the highest percentage of 28,800bps modems (45.6%).

#### *Public Library World-Wide Web and Gopher Servers*

Overall, 5.5% of public libraries maintain a gopher server and 10.7% maintain a Web server (see Figure 43). The percentage of public library gopher and Web servers increases as library population of legal service area increases. In all 55.1% of public libraries that serve a population of legal service area of 1 million+ that have a Web server and only 3.5% of public libraries that serve a population of legal service area of less than 5,000 that have a Web server. Similarly, 14.3% of pub-

lic libraries that serve a population of 1 million+ operate a gopher server, while 3.8% of libraries that serve a population of legal service area of less than 5,000 operate a gopher server. Of particular interest is that public libraries that serve population of legal service areas of 250,000 or greater are more likely to maintain both a Web and gopher server (percentages ranging from 10.6% to 16.8%) than are public libraries that serve population of legal service areas of 249,999 or less (percentages ranging from 0.0% to 5.4%).

Nearly the same percentage of public libraries in the four regions maintain a gopher server, with libraries in the West, 6.0%, maintaining the highest percentage of gopher servers (see Figure 43). Libraries in the West and South, however, maintain nearly twice the percentage of Web servers (17.7% and 15.3%, respectively) as do libraries in the Midwest and Northeast (9.8% and 6.5%, respectively). The data also show that libraries in the South and West (2.3% and 2.1%, respec-

**Figure 43. Percentage of Public Library Gopher/World-Wide Web Servers by Population of Legal Service Area and Region.**

Population of Legal Service Area			
	Gopher Server	Web Server	Percent Both
1 million +	14.3%	55.1%	14.3%
500,000-999,999	24.8%	49.2%	16.8%
250,000-499,999	14.5%	35.6%	10.6%
100,000-249,999	10.3%	24.3%	5.4%
50,000-99,999	5.0%	16.9%	2.9%
25,000-49,999	7.0%	13.7%	2.6%
10,000-24,999	4.8%	11.2%	0.0%
5,000-9,999	3.0%	3.5%	1.0%
Less than 5,000	3.8%	3.5%	0.0%

  

Region			
	Gopher Server	Web Server	Percent Both
Midwest	5.5%	9.8%	1.5%
Northeast	5.6%	6.5%	1.3%
South	4.7%	17.7%	2.3%
West	6.0%	15.3%	2.1%
Overall	5.5%	10.7%	1.7%

tively) are more likely than libraries in the Midwest and Northeast (1.5% and 1.3%, respectively) to maintain both a gopher and a Web server.

A vast majority of public library gopher or Web servers are operated by library staff (see Figure 44). Notable exceptions exist, however for libraries that serve population of legal service areas between 10,000 and 49,999. These libraries indicate a higher use of local organizations, commercial providers, and Other institutions as operators of their Web and gopher services. A review of the Other category responses indicates that these libraries rely on statewide library agencies and combinations of local organizations and commercial providers to operate and maintain their Web and gopher servers. Libraries in the Midwest and South tend to rely on Other (35.2% and 45.4%, respectively) statewide library agencies and regional library consortia to maintain their Web and gopher servers more so than libraries in the Northeast and South. Interestingly, more libraries in the West (12.9%) than any other region rely on local organizations to operate their Web or gopher servers, while more libraries in the Northeast (11.9%) and South (11.1%) rely on commercial providers to run their Web and gopher servers.

#### Identified Public Library Benefits to Connecting to the Internet

The survey obtained data from public libraries describing the most important benefit gained by their library through the library's Internet connection. The written responses were grouped according to an overall coding scheme derived from the data (see Figure 45). Due to the qualitative nature of the question, these responses are not weighted. Overall, the top three most important benefits of connecting to the Internet are the ability of libraries to:

- (1) Access electronic Internet-based information, with 219 mentions;
- (2) Communicate with other professionals, libraries and the public, with 79 mentions; and,
- (3) Enhance reference service capabilities, with 72 mentions.

Public libraries find other benefits to connecting to the Internet, including improving the quality of library services, enhancing the library's status with the public, and reducing costs by acquiring library material via the Internet.

**Figure 44. Primary Public Library Gopher/World-Wide Web Server Operator by Population of Legal Service Area and Region.**

Population of Legal Service Area				
	Library Staff	Local Organization	Commercial Provider	Other
1 million +	86.8%	0.0%	0.0%	13.2%
500,000-999,999	79.5%	3.5%	9.4%	7.7%
250,000-499,999	68.0%	0.0%	10.1%	21.9%
100,000-249,999	58.6%	11.7%	4.3%	25.3%
50,000-99,999	59.5%	0.0%	3.0%	37.6%
25,000-49,999	57.7%	15.2%	10.9%	16.3%
10,000-24,999	16.1%	0.0%	19.2%	64.6%
5,000-9,999	66.5%	0.0%	0.0%	33.5%
Less than 5,000	91.5%	0.0%	0.0%	8.5%

  

Region				
	Library Staff	Local Organization	Commercial Provider	Other
Midwest	60.3%	3.1%	1.3%	35.2%
Northeast	59.0%	1.7%	11.9%	27.4%
South	42.6%	0.9%	11.1%	45.4%
West	70.6%	12.9%	4.5%	11.9%
Overall	58.6%	3.9%	7.3%	30.1%

The above section presented the data from the survey. The next section identifies issues concerning public library involvement with the Internet and evolving NII based on the survey data.

### PROGRESS AND ISSUES

Public libraries deserve some congratulations and recognition for the strides they have made in connecting to the Internet and in moving into the global information superhighway. Not only has there been a significant increase in connectivity, but public libraries are committing significant resources to support their information technology (IT) infrastructure, increasing the number and band-width of their connections to the Internet, and providing additional public access terminals for their communities to access the Internet directly. Many public libraries are rapidly embracing the global networked environment and are implementing strategies to provide networked information services to their patrons.

The findings presented in the previous section of the report show that public libraries in the United States have made impressive gains in connectivity:

from 21% of public libraries connected to the Internet in 1994; to 44% connected in 1996; and a projected 76% connected by March 1997. In terms of public access to the Internet, public libraries went from 13% providing public access to the Internet in 1994, to 28% in 1996, and to a projected 50% by March 1997 (see Figures 5-7).

Thus, on the one hand significant progress is being made by public libraries to transition into the global networked environment — and those making this transition can take pride in their accomplishments. On the other hand, while these statistics are impressive, the data also identify a number of issues and concerns regarding public libraries and their move onto the Internet. This final section of the report identifies selected topics and issues for additional discussion.

### Disparities Remain

By 1997 virtually all public libraries serving populations of 100,000 or greater will have Internet connections (see Figures 5 and 6). But for communities of 99,999 or less, a significant percentage of the libraries will have no connections and even fewer will provide

Figure 45. Identified Public Library Benefits That Internet Connectivity Provides.

Benefit *	Totals **
Access access to information available on or through the Internet	219
Communication email with other professionals, libraries and public	79
Reference reference service improved (by speed, by providing current info)	72
Services the quality of library services were improved	35
Continuing Education training or education for staff and public	25
Public Relations providing Internet service improved library status with public	21
Cost Savings libraries able to acquire new or expensive resources now available through the Internet	14
No Benefit no benefit from Internet (not connected long enough, too busy to use)	13
Inter-Library Loan benefit seen in Inter-Library Loan	11
Resource Sharing with other agencies (government, libraries)	6
Cataloging improved cataloging work	4
Grand Total	499

\* Of the 499 benefits listed by respondents, some libraries listed two or more.

\*\* Due to the qualitative nature of the data, these responses are not weighted

public access to the Internet. Indeed, for public libraries serving populations of less than 5,000 almost half will not have any type of Internet connectivity by March 1997. In terms of regions, 47% of libraries in the South will not have connections to the Internet whereas only 31% in the West will not have connections.

In comparing the percent of public libraries that provide public access to the Internet from 1994, to 1996, and projected to 1997, the growth rate is much smaller than the rate that the libraries are obtaining Internet access for the library only (see Figure 6). Thus, despite significant gains in overall connectivity only 50% of the public libraries are projected to be able to provide public access to the Internet by March 1997. The vast majority of the public libraries *not* providing public access to the Internet serve populations of 99,999 or less.

Disparities also remain regarding the *type* of connectivity that the various public libraries have to the Internet. Roughly half of the libraries serving populations of 500,000 or more have T1 connectivity to the Internet, whereas very few of the libraries serving populations of 49,999 or less have T1 connectivity (see Figure 12). Interestingly, the South and West have almost twice as many libraries connected with T1 compared to libraries in the Midwest and the Northeast. The type of connectivity enjoyed by the library has a significant impact on the level and type of networked services that the library can then provide.

Additional disparities occur in terms of the resources that public libraries commit to information technology expenditures. Average annual public library IT operating expenditures in the West are \$66,857 compared to \$15,325 in the Northeast — or about four

times greater IT expenditures in public libraries in the West than in the Northeast (see Figure 16). Annual average communication costs for public libraries are \$5,338, but in the West they average \$16,580 (see Figure 17). Overall, public libraries in the West have greater expenditures for Internet-related costs, have higher connectivity rates, and provide a greater extent and type of Internet services. The perception of what types of costs, e.g., hardware, software, communications, etc., have the greatest impact on the public library's involvement in the Internet also vary considerably (survey question 5) depending on the population size the library serves.

As shown earlier in the report, public libraries in the West and South expect that their Internet-related cost expenditures will increase by nearly a factor of two over the next year compared to public libraries in the Midwest and Northeast. Other significant differences in expected increases in Internet-related expenditures are likely to *increase* disparities in public library Internet connectivity and services in the future.

Given these disparities in IT expenditures, connectivity rates, and the type of connectivity available to public libraries, additional disparities appear, then, in terms of the types of Internet-based services that the libraries can provide. Just as one example, approximately 50% of public libraries serving populations of 500,000 or more have Web servers whereas only 17% of the libraries serving populations of 50,000 - 99,999 have Web servers — and only 3.5% of the libraries serving populations of 9,999 or less have such Web-based services (see Figure 43).

Another perspective, however, on disparities in access comes from examining the number of public library workstations available per population. For libraries serving populations of one million or more there are 84,422 individuals per workstation compared to the overall average of 26,525 individuals per workstation (see Figure 40). Thus, one could conclude that by one measure, public libraries serving larger population centers have much greater connectivity rates than those serving smaller population centers. But, in fact, it may be more difficult for a user to access the available workstations in the library serving that larger population center than in a library serving the smaller population center.

As readers review the various Figures in this report, a range of other disparities are apparent among public libraries regarding their use of the Internet. National and state policymakers as well as the public li-

brary community, however, have yet to determine goals for resolving such disparities or agreeing on strategies to minimize such disparities. Indeed, now that we know such disparities exist in terms of connectivity, type of connectivity, and ability to provide networked services to the public, what should be done? Who, or what organizations, are responsible for dealing with these issues? Is it inevitable that such disparities will exist?

### Connectivity Versus Services

The data reported from this study should *not* be interpreted to mean that because most public libraries will soon have some type of Internet connectivity, they are providing a range of Internet-based services and resources. There are a number of different levels of connectivity that should be identified:

- Dial-up Connectivity: The library can, through the use of a workstation and modem, access the Internet in text mode only.
- Dial-up Connectivity with SLIP/PPP: The library can, through the use of a workstation and modem with SLIP/PPP access the Internet in full graphics mode — although such access is likely to be painfully slow.
- Dedicated Line Connectivity: The library typically has leased a dedicated line from a (relatively) slow bandwidth of 56K, to perhaps ISDN, to T1, or perhaps to T3.

In each of these situations, connectivity may be provided for library staff only, or for the public and the library staff. As the data from this survey suggest, public library connectivity has increased, but the *level* and *extent* of public library connectivity still require significant improvement to provide high quality networked services.

In terms of services and resources provision, there are also a number of levels to be considered:

- No Services or Resources Provided. In this situation, the public library simply provides access to the Internet. Patrons use a library workstation to access resources and services provided by others on the Internet.
- Resources Provision. The library makes available information resources such as databases, electronic newsletters, local government information,



etc. In effect, the library transfers patron access from print sources to electronic sources.

- **Self-Assisted Services.** This type of networked services allows the user to access resources, and without the assistance of another, put a hold on a book, make a reservation to attend a library program, or manipulate data.
- **Interactive Services.** In this type of service the patron may engage in interactive video reference services with library staff, participate in a discussion about a best seller, or collaborate with other users in the use of particular library resources.
- **Knowledge-based Services.** In this situation, the library provides on-demand, customized information services: for example, the library automatically informs the user electronically that, based on her previous reading habits, a new book has arrived or a certain Web site may be of interest to her, etc.

These levels of resource and services provisions are illustrative only to make the point that most public libraries have yet to proceed much beyond resources provision and some self-assisted services. For example, the data show that 31% of public libraries with connectivity to the Internet have such connectivity via a 28.8 baud dial-up modem (see Figure 11). While such connectivity is better than nothing, it does not enable the access to and delivery of advanced and high quality services. Acceptable and high quality resource provision, self-assisted, interactive, and knowledge-based services require high-bandwidth at the T1 level and beyond.

The Figures that show 78.3% of the population of the library legal service area being served by a public library with some type of Internet connectivity in 1996 and projected to be 91% of the American population in 1997 may sound impressive but can be very misleading (see Figures 7 and 8). In fact, a library that has one Internet dial-up connection and serves a legal population of about 200,000 provides relatively poor Internet-based connectivity, and possibly offers no services as described above; whereas there can be another public library also serving a population of about 200,000 with 28 public access workstations, with T1 connectivity, managing its own Website, and offering a range of networked services. Both public libraries, for purposes of these Figures, provide their population with Internet connectivity.

Thus, the sound bite that by March 1997 one can project 76% of public libraries to be connected to the Internet can be extremely misleading until further analysis determines the *type, extent, and impact* of connectivity that the library has, and the *degree and quality* to which networked electronic resources and services are also being provided by the library. It is important to recognize that being connected to the Internet is only a first, albeit important, step for public libraries as they transition to the global networked environment. Many additional steps are required — some of which we may not now know — for the library to be a successful and effective provider of networked information resources and services.

### The Goal of Universal Service

The goal of public libraries to provide Universal Service to the public for access to the Internet is one that has received much attention and discussion during recent years. But as this discussion and policy debate continues, there is little agreement on what constitutes "Universal Service" and what types of "services" constitute basic and advanced services. What is known, however, is that connectivity to the Internet is *not* provision of networked services. Thus, policy makers should not confuse the data from this survey describing levels of connectivity with the degree to which public libraries provide networked-based services.

As this report is being written, the FCC Federal-State Joint Board is in the process of developing rules to implement universal service provisions mandated in the *Telecommunications Act of 1996* (P.L. 104-104 section 254). As discussed in the introduction to this report, libraries and schools may receive special attention to provide affordable access to the Internet and the availability to Internet services. Section 254b offers the following principles to advance Universal Service:

- **Quality and Rates:** Quality services should be available at just, reasonable, and affordable rates.
- **Access to Advanced Services:** Access to advanced telecommunications and information services should be provided to all regions of the Nation.
- **Access in Rural and High Cost Areas:** Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecom-

munications and information services . . . that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas.

- **Equitable and Nondiscriminatory Contributions:** All providers of telecommunications services should make an equitable and non-discriminatory contribution to the preservation and advancement of universal service.
- **Access to Advanced Telecommunications Services for Schools, Health Care, and Libraries:** Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services as described in subsection (h).
- **Additional Principles:** Such other principles as the Joint Board and the Commission determine are necessary and appropriate for the protection of the public interest, convenience, and necessity and are consistent with this Act.

Later, in section (B) of the universal services provision, the law states, "all telecommunications carriers serving a geographic area shall . . . provide such services to elementary schools, secondary schools, and libraries for educational purposes at rates less than the amounts charged for similar services to other parties."

Such language raises very complicated issues. For example, the data reported in this survey suggest that approximately 25% of public libraries that serve 9% of the country's population will require an Internet connection after March 1997 (see Figures 5-8). The data also show that these public libraries have small communities, typically 5,000 or under, and often are located in rural areas. For a host of reasons, the costs to connect the last 25% of public libraries and the costs for those libraries to provide networked services are likely to be significant. At what point can it be said that public libraries are providing "universal service" to the public? At a 75% connectivity rate? When 90% provide Web-based information resources and services?

As the FCC and the Federal-State Joint Board develop rules to implement these and other universal services provisions, it is important to recognize that serious disparities already exist in the provision of Internet connectivity and services through public libraries. The extent to which these disparities can be

resolved by the *Telecommunications Act of 1996*, by states, local communities, and the public library community has yet to be determined.

### Quality of Network Services

Just as public library connectivity to the Internet is not service, connectivity to the Internet, in and of itself, does not mean that the library manages and evaluates its Internet connections and services effectively. Data reported from this survey do not address the quality of the networked services that are being provided, the extent to which members in the library's community use such services, or the degree to which networked meet the needs of the library's community.

The 1996 survey data found that only 10.7% of public libraries maintain a Website (see Figure 43). Knowing this statistic is useful but in reality, users of public library Websites know that the quality of these sites varies considerably. Some Websites have only a homepage with a picture of the library and its hours of operation. Others have extensive online services, access to their OPAC, online reference and referral services, and links to other Websites. The public library community is only beginning to identify quality standards and criteria of excellence for assessing networked services and determining the degree to which these services meet community information needs.

Determining what exactly constitutes the "network" or "networked services" is a complicated task in itself. Yet, without a clear sense of how best to define these terms, evaluation will be difficult. Public library administrators may wish to think of the network as comprising these components:

- **Technical infrastructure:** the hardware, software, equipment, communication lines, and technical aspects of the network.
- **Content:** the information resources available on the network.
- **Services:** the activities in which users can engage and the services that users may use to complete various tasks.
- **Support:** the assistance and support services provided to help users better use the network.
- **Management:** the human resources, governance, planning, and fiscal aspects of the network.

These five basic components suggest the general areas where public library administrators can begin assessment efforts of their networks and networked services.

Public libraries were early adapters in the use of performance measures with the publication of *Output Measures for Public Libraries* (Van House, et. al., 1987). As public libraries extend their Internet connectivity and services, thought will need to be given to developing networked-based performance measures. Such measures can:

- **Identify the successful and less successful aspects of the network and network services in light of user needs and institutional goals.**
- **Provide trend data to assess changes in the network and network services over time.**
- **Assist decision makers in allocating or reallocating resources and in planning for future network development.**
- **Assist network managers in justifying expenditures and accounting for those expenditures.**
- **Monitor network activities and services to detect any changes in activities or the quality of services.**
- **Determine the degree to which users are satisfied with the network and network services.**
- **Serve as a first step in benchmarking (identifying best-practice performance, using that performance as a goal, investigating the factors that led to the performance, and then trying to replicate that level of performance).**

Simply stated, performance measures ask decision makers to answer the questions: How well is the service or activity doing what the library claims it should be doing? At what cost? And with what effects?

There are a number of ways to categorize the measures that will be needed. One approach is to think of measures in the following areas:

- **Extensiveness:** this is a measure of the amount or extent to which the services are provided: for example, the number and types of people using the service.

- **Efficiency:** this is a measure of the cost or resources required to provide the service: for example, cost per service transaction.
- **Effectiveness:** an effectiveness measure is one that focuses attention on the degree to which the objectives of the program or service are met.
- **Service quality:** such measures are concerned with how well a service or activity is done: e.g., percentage of transactions where users acquire the information they need.
- **Impact:** an impact measure focuses attention on the benefit or result of the service or activity: e.g., the degree to which using Internet services empowers the user to resolve other problems or improved his/her quality of life.
- **Usefulness:** this is a measure of appropriateness, the degree to which the services are useful or appropriate for the individual user: e.g., percentage of services of interest to different types of user audiences.

These areas for assessment suggest the importance of considering different types of measures in assessing various aspects of network activities and services for public libraries.

In a broader organizational context, resource allocation, planning, and improving services require measurement and evaluation of networked information services. Without measures that can evaluate particular services, decision makers must rely on intuition and anecdotal information as a basis for assessing the usefulness and value of a particular service. Perhaps most importantly, measurement and evaluation provide users with an opportunity to offer feedback on how well services are meeting their needs. To a large degree, however, public library administrators have limited knowledge about the performance and quality of their networked activities and services.

Developing, operationalizing, and validating a range of performance measures is essential if public libraries intend to: determine which networked information services are effective; understand the impact of networking on the educational process; and identify the costs required to build and maintain the network. Without such information, administrators of networked systems and services will be unable to justify such services and unable to determine the degree to which they meet user needs.

Public libraries will need to develop a regular program of data collection, performance measures, and related statistics of networking activities and services. Many public libraries are already seeing evidence that "hits" on their Websites are going up while circulation rates stay stagnant or decline; or that networked-based reference and referral transactions are increasing while traditional measures of reference transactions (on-site) stay the same or decline. Traditional performance measures will need to be augmented to assess the public library's activities and performance in the networked environment (Bertot and McClure, 1996c).

### Life Cycle of Public Library Internet Development

A life cycle of public library Internet development appears to be emerging. Briefly, that life cycle is awareness of the Internet, planning and obtaining Internet connectivity, learning how to use the Internet and acquire resources and services successfully, using the connectivity for internal library operations, making public access to the Internet available, training the public in Internet use, upgrading connectivity and bandwidth, putting up library electronic resources on the Internet, developing evaluation techniques, and providing a range of innovative and networked-based services. Throughout this process there is an ongoing adoption and beta-testing of new technologies and services. While other components of this life cycle are likely, it suggests a general process that many public libraries follow in their Internet development.

The analysis of data reported from this survey, as well as that reported in the 1994 survey, lacks a context in terms of this life cycle. This life cycle occurs over a number of years, and while some public libraries may take greater or lesser time within these various stages, the library's place in this life cycle can provide an important context in understanding other data that they reported from the survey. Thus, in hindsight, an excellent additional question that should have been included on the survey is: *How many years has this library been connected to the Internet?*

For example, libraries reported costs for various types of Internet-related expenditures (question 12). A library that has just begun its connectivity may have significant start-up and capital expenditures compared to a library that has been connected for three years and is now in the process of developing Internet services. Within a particular region, it would be especially interesting to have information describing costs

or types of connectivity in light of this life cycle. Data might be much more understandable when being compared across regions or across different populations served.

Knowing the stage at which a public library is involved in the life cycle of Internet development would also help researchers and policymakers to better understand the type of connectivity to the library and the type and extent of Internet-based services that the library provides. Thus, when reviewing the data reported in this survey, one cannot ascertain connectivity or services provision in light of the library's experience and stage in Internet development. This "lesson" as well as others identified in the next section should be considered if the survey is repeated in 1998.

### Preparing for the Next Survey

The 1994 survey was prompted primarily because of the opportunity, then, to obtain national data describing public libraries and the Internet that could be used to resolve policy issues regarding the role of libraries in the NII. As a result of the 1994 survey data, NCLIS and others were able to provide testimony, meet with federal policy makers, and work to extend the role of public libraries in the NII. The 1994 survey data remained the only comprehensive descriptive data available that described public library involvement and use of the Internet until the publication of the 1996 data reported here.

As stated earlier in this report, the 1996 survey had less focus on affecting NII policy than on (1) obtaining longitudinal data such that trends in public library use of the Internet could be identified, (2) descriptive information about public library use of the Internet could be used for internal library planning, and (3) key issues affecting the future development of public libraries in the Internet could be identified. In fact, however, data from the 1996 survey were analyzed and reported in April, 1996 to the FCC, Federal-State Joint Board on universal service regarding disparities in public library Internet access and use. Such data may affect FCC rulemaking to promote policies that assist libraries have more affordable access to networked services.

Additional analyses and assessment of key issues can be done with the data reported here. Furthermore, there are numerous other topics and issues that the survey was not able to address due to space and resource limitations. The authors hope that others will

use data from this survey to expand discussion of issues and topics only introduced in this report. Indeed, leaders in the public library community should begin to consider, now, how a 1998 survey might be undertaken, which organizations should be or are willing to sponsor such an effort, and possibly revising the methodology used when conducting the next survey.

NCLIS has taken on responsibility for conducting the 1994 and 1996 surveys. Increasingly, however, additional resources beyond those from NCLIS will be needed to continue the administration of the survey. Federal agencies such as the Department of Education, the National Center for Educational Statistics (NCES), and others have shown interest in these surveys. Additional organizations such as the American Library Association (ALA), the Public Library Association (PLA), the Urban Libraries Council (ULC), the Chief Officers of State Library Agencies (COSLA), participation from the private and publishing sectors, and perhaps individual public libraries might join in a consortium to support a next public libraries and the Internet survey.

Future surveys should also consider different methods for data collection either as part of a national survey or as replacement for the written questionnaire survey that has been used for the 1994 and 1996 surveys. For example, the authors experimented with mounting the 1996 survey on a Website and encouraged all libraries receiving the survey to respond via that Website (Bertot and McClure, 1996a; to view a copy, point your browser to <http://research.umbc.edu/~bertot/nclissurvey.html>). Some 60 libraries did respond via the Website and provided suggestions for how the survey might be better administered electronically in the future.

Another area that future surveys might address is topics related to the *quality* of networked services provided by public libraries. As discussed earlier in this section, descriptive counts that stress the extensiveness of services, while useful, will need to be extended such that a range of performance measures assessing effectiveness, impact, and quality of services can be assessed. The national surveys conducted in 1994 and 1996 may provide a basis for developing such measures.

The authors have found that the level of effort required to obtain high response rates to the surveys, i.e., 77% in 1994 and 71% in 1996, is significant and

time consuming. Yet, due to the sampling and weighting scheme used (as developed by NCES) and discussed earlier in the methods section of this report, such high response rates are essential if the survey is to result in accurate and generalizable data. Indeed, even with the high response rates obtained thus far, the method does not allow for generalization of findings to individual states.

Thought might also be given to extending or revising the data collection to allow for follow-up activities. For example, the data reported here seem to present some anomalies in terms of connectivity levels across different regions of the country. Survey data produces findings that are primarily *descriptive* and only to a limited extent might they be *explanatory*. Since the data are *descriptive* only, follow-up site visits, phone interviews, focus group sessions, electronic surveys or discussions, etc. might be used to better *explain* the findings.

Although the authors suggest that a broader base of support be established for conducting future public libraries and the Internet surveys, and although we suggest rethinking aspects of the method with the objective of improving the usefulness of survey results, we believe that such a survey every two years is *essential* for the public library community and policy makers to:

- Obtain data describing the growth, trends, and issues related to public libraries' use and involvement in the Internet.
- Provide a common base of information from which individuals from different stakeholder groups can discuss and analyze the role of public libraries in the networked environment equally.
- Make known to the library community and federal, state, and local policy makers information and issues describing how public library involvement in the Internet affects the public good.
- Assess individual library network development and plans for future network services.
- Better plan for and design public library involvement in the Internet to best benefit the public at large.

The benefits from such national surveys are clear. The importance of conducting such surveys has been demonstrated on numerous occasions. Thus, the challenge for improving and extending this survey is one that must be addressed and resolved.

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Appendix A

Survey Instrument



## Survey of Public Library Internet Use

**Instructions:** This survey is about your library's level of involvement with or use of the Internet. Please take the time to answer the questions below by marking the appropriate selection or filling in answers as necessary. Your responses will assist us to gain an understanding of public library uses of the Internet. Thank you for your participation! **PLEASE RETURN YOUR QUESTIONNAIRE BY JANUARY 31, 1996.** For questions concerning the survey, contact:

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 University of Maryland Baltimore County (410) 455-3883 phone  
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If your library is not now using the Internet, please fill out questions 1 to 8 and return.

### PART A: General Library Information and Internet Connection Issues; To be completed by the library director

1. Name of person responding: \_\_\_\_\_ Title: \_\_\_\_\_
2. Total number of librarians (include ALA/MLS and others with the title) in FTE: \_\_\_\_\_
3. What were the total library operating expenditures for the last completed fiscal year? \$ \_\_\_\_\_
4. What were the total library materials expenditures for the last completed fiscal year? \$ \_\_\_\_\_
5. Please assess the degree to which the following possible factors affect your library's current level of involvement with the Internet: (PLEASE CIRCLE ONE NUMBER FOR EACH ITEM)

	Very Important			Very Unimportant			Don't Know
	1	2	3	4	5		
a) Costs of system/server hardware (e.g., workstations, terminals, servers)	1	2	3	4	5		<input type="checkbox"/>
b) Costs of software (e.g., operating systems—Unix, Windows NT—applications software—WordPerfect)	1	2	3	4	5		<input type="checkbox"/>
c) Costs of communications hardware/fees (e.g., routers, modems, long distance charges)	1	2	3	4	5		<input type="checkbox"/>
d) Costs of training and education (for staff and users)	1	2	3	4	5		<input type="checkbox"/>
e) Costs of content/resource development (e.g., special collections development, Web home page development)	1	2	3	4	5		<input type="checkbox"/>
f) Availability of in-house computer technical expertise	1	2	3	4	5		<input type="checkbox"/>
g) Availability of staff time to develop expertise on the Internet	1	2	3	4	5		<input type="checkbox"/>
h) Availability of federal money	1	2	3	4	5		<input type="checkbox"/>
i) Availability of state money	1	2	3	4	5		<input type="checkbox"/>
j) Other (please specify): _____	1	2	3	4	5		<input type="checkbox"/>

6. Interest in the Internet at this library is motivated primarily by: (CHECK [X] ONE ONLY)

- |   |  |
|---|--|
| <input type="checkbox"/> Library strategic planning             | <input type="checkbox"/> Community interest            |
| <input type="checkbox"/> State-wide network initiatives         | <input type="checkbox"/> Internal staff expertise      |
| <input type="checkbox"/> Interest of the library administration | <input type="checkbox"/> Other (please specify): _____ |
| <input type="checkbox"/> Interest of the library governing body |  |

7. Is your library currently connected to the Internet in any way?

- ☐ YES (please complete questions 9 through 19)      ☐ NO (please complete question 8)